

WORK ITEM 1: Propulsion Shaft, Remove, Inspect, And Install

1. SCOPE

1.1 Intent. This work item describes the requirements for the Contractor to remove, inspect, and reinstall port and starboard propeller shafts.

1.2 Government-furnished property.

APM: Validate all GFP data. If the Spec Package's Consolidated List of GFP is changed, ensure it is changed in the source WI and GFP style is applied.

APM: Note-Hulls 47206-47234 use 3-1/2" seal, 47235 and up use 3-3/4" seal.

MTI	ITEM DESCRIPTION	NSN/PN	QTY	ESTIMATED COST
Y	*Propeller shaft	NSN: 2010-01-463-9116	2 ea.	\$3,297.13
N	Shaft Seal(3-1/2")	NSN: 2040-01-497-3186	2 ea.	\$280.27
N	Shaft Seal (3-3/4")	PN: 02-212-334	2 ea.	\$465.00

*New or refurbished equipment that the Government may provide for installation in place of existing equipment.

2. REFERENCES

COAST GUARD DRAWINGS

Coast Guard Drawing 47B-MLB 161-010, Rev M, Shaft Struts and Barrels

Coast Guard Drawing 47B-MLB 243-010, Rev U, Propulsion Shafting Bearings and Seals

COAST GUARD PUBLICATIONS

Coast Guard Technical Publication (TP) 3359, SWBS 241-541, Mar 2007, Manufacturer's Information Book - SWBS Group(s) 241-541, SWBS 243, Sections A, B, C, D, Propulsion Shafting

Surface Forces Logistics Center Standard Specification 0000 (SFLC Std Spec 0000), 2014, General Requirements

Surface Forces Logistics Center Standard Specification 0740 (SFLC Std Spec 0740), 2014, Welding and Allied Processes

OTHER REFERENCES

None

3. REQUIREMENTS

3.1 General.

3.1.1 CIR. The Contractor shall submit a CIR for the inspections listed in the following paragraph(s):

- 3.4 (Inspections)
- 3.5 (Measurements)

3.1.2 Tech Rep.

Not applicable.

3.1.3 Protective measures. The Contractor shall furnish and install all protective coverings to seal off and protect all non-affected vessel's components, equipment, and spaces near the work area against contamination during the performance of work. Upon completion of work, the Contractor shall remove all installed protective measures, inspect for the presence of contamination, and return all contaminated equipment, components, and spaces to original condition of cleanliness.

3.1.4 Interferences. The Contractor shall handle all interferences in accordance with (SFLC Std Spec 0000) 2012, paragraph 3.3.5 (Interferences). Known interferences include, but are not limited to the below-listed:

- Line cutters, (1 each shaft).
- Shaft zincs, (3 each shaft).
- Ropeguard.
- Deckplates.
- Mechanical shaft seals.

3.1.5 Operational test – initial. Prior to commencement of work, the Contractor shall witness Coast Guard personnel perform an initial operational test of all items or shipboard devices to be disturbed, used, repaired, or altered, to demonstrate existing operational condition. Submit a CFR.

3.2 Mandatory preliminary procedure. The Contractor shall mark existing shaft position, and match-mark shaft coupling bolts to their respective holes, to facilitate reinstallation procedures. Prior to disassembly, use a dial indicator to take and record run-out readings on the shaft just forward of the shaft seal in accordance TP 3359. Submit CFR.

3.3 Removals. The Contractor shall clean the shaft free of all marine growth and remove shaft and attached components to a suitable repair facility. Ensure shaft is protected from the weather and supported at all bearing journals at all times until reinstallation.

3.4 Inspections. The Contractor shall visually inspect the following components, as applicable, for excessive wear and other mechanical defects such as nicks, cracks, and corrosion, as applicable: Submit a CIR.

- Shaft surfaces.
- Strut and stern tube bearing and bearing journal surfaces.
- Strut and stern tube bearing housing surfaces.
- All shaft and propeller associated fasteners.
- Couplings.
- Stern tubes
- Stern tube/shaft sealing systems.
- Propeller shaft seals.

- Mechanical shaft seal mounting flange.
- Shaft zincs.
- Line cutters.

3.5 Measurements. The Contractor shall measure and record the following equipment statistics. Submit a CIR.

- Measure keys and keyways.
- Measure all strut and stern tube bearing internal diameters at forward, middle, and aft locations.
- Measure all bearing journal diameters on the shaft at forward, middle, and aft locations.
- Measure runouts for shaft taper, shaft straightness, and coupling end diameters.
- With the coupling fit to shaft and key in-place, measure the coupling face and bore runouts.

3.6 NDI. The Contractor shall perform NDI of all bearing sleeves, shaft tapers, coupling bolts, keyways, and welded repair surfaces, in accordance with (SFLC Std Spec 0740) 2012, Appendix C. Submit a CFR.

3.7 Inspection survey. The Contractor shall perform a straightness inspection of the shaft on a lathe. Conduct a dial indicator run-out survey at every 20 inches of the shaft. Plot the run-out readings on an appropriate scale to detect any shaft bending. Submit a CFR.

NOTE

Do not machine propulsion shaft, over torque propeller nut, or heat coupling to achieve 80% fit. Fit shall be achieved by properly boring coupling.

3.8 True coupling fitting. The Contractor shall machine, grind, or hand-stone couplings, if necessary, to achieve an 80 percent contact fit. True coupling to shaft by cutting coupling faces and land area.

3.9 Alignment check. If a Change Request has been authorized and released, the Contractor shall conduct an alignment check by removing designated strut and stern tube bearings as shown on Coast Guard Drawings 47B-MLB 161-010 and 47B-MLB 243-010. The Contractor shall perform an alignment check of the stern tube and strut bearing housing bores relative to the shaft centerline using the optical or piano wire method. Submit CFR.

3.10 Reinstallation. The Contractor shall reinstall the propeller shaft to the original configuration and accomplish the following, using Coast Guard Drawings 47B-MLB 161-010 and 47B-MLB 243-010.

3.11 Renew. The Contractor shall renew all fasteners, hardware, lockwire and isolators and the mechanical shaft seal listed in Government-furnished equipment. Install in accordance with manufacturer's instructions, TP 3359 and Coast Guard Drawing 47B-MLB 243-010.

NOTE

A possible source of supply for line cutter overhaul kits is Spurs Marine, <http://www.spursmarine.com>

3.12 Line cutter overhaul. If a Change Request has been authorized and released, the Contractor shall overhaul the designated line cutter assemblies with Contractor-furnished overhaul kit in accordance with manufacturer's instructions. The overhaul kit shall be an authorized kit by the line cutter manufacturer.

3.13 Post repair measurements. The Contractor shall measure and record the stern tube and strut bearing clearances in accordance with Table 1, Stern Tube & Strut Bearing Measurements.

3.14 Government furnished property. The Contractor shall be aware the government reserves the right to provide materials, property, and items when a benefit to the US Coast Guard can be obtained.

NOTE

Coast Guard Personnel will operate all vessel equipment and machinery.

Shaft continuity check must be performed while vessel is waterborne.

3.15 Shaft continuity check. The Contractor shall measure the continuity between the reduction gear output flange and the propeller shaft coupling flange on both the port and starboard shafts. The measurement shall be made with the multimeter set to the DC millivolt scale and recorded in Table 2. Submit a CFR.

3.16 Operational test – post repairs. After completion of work, the Contractor shall witness an operational test by Coast Guard personnel of the shafting system to prove satisfactory operating condition. Conduct a sea trial to test the propeller shaft in all modes of operation for a minimum of 4 hours. Inspect and correct any excessive leakage, abnormal noise and excessive vibration. Submit CFR.

TABLE 1 - STERN TUBE & STRUT BEARING MEASUREMENTS

MEASUREMENT ITEM PROMPT	MEASUREMENT (0.018 IN MIN – 0.10 IN MAX)
STBD Stern Tube Horizontal Diametric Clearance	
STBD Stern Tube Vertical Diametric Clearance	
PORT Stern Tube Horizontal Diametric Clearance	
PORT Stern Tube Vertical Diametric Clearance	
STBD Strut Tube Horizontal Diametric Clearance	
STBD Strut Tube Vertical Diametric Clearance	
PORT Strut Tube Horizontal Diametric Clearance	
PORT Strut Tube Vertical Diametric Clearance	

TABLE 2 - PROPULSION SHAFT CONTINUITY MEASUREMENTS

SURVEY LOCATION	MILLIVOLT READING (ACCEPTABLE RANGE 10MV – 200MV)
Port Shaft Isolator	
Starboard Shaft Isolator	

4. NOTES

4.1 Coast Guard Personnel. Coast Guard Personnel will operate all vessel equipment and machinery.